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Paper No. 23

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Application Number: 09/479,267
Filing Date: January 06, 2000
Appellant(s): UENO ET AL.

Bradley J. Bereznak
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/17/03.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

It is noted that this section is not applicable to the instant application since reinstatement of the Appeal was made after a non-final Office Action. No amendments were made either way, however.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-4 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,046,892	Aoshima et al	4-2000
6,157,525	Iwasaki et al	12-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-4 are rejected under 35 U.S.C. 103(a) as obvious over Aoshima et al (US 6,046,892) in view of Iwasaki et al (6,157,525).

Aoshima et al discloses a spin valve magnetoresistance sensor (20), as shown primarily in FIGs. 4 & 5, including: a base layer (21, 22) layered on top of a substrate (not shown, see col. 3, line 3); the base layer including a first base film 21 having a nonmagnetic metal, i.e., Ta and a second base film (22) formed on top of the first base film; the second base film (22) having an alloy represented by NiFeX wherein X includes one of Cr, Nb and Rh, i.e., NiFeCr, the second base film having a face-centered cubic (fcc) structure and a (111) orientation. The fcc structure is inherent to the NiFeCr layer since it follows from the PdPtMn being of fcc structure, i.e., the head would not operate properly if NiFeCr (and Ta layer 21) did not also have a fcc structure. Aoshima et al is expressly silent, however, as to the NiFeCr layer having an (111) orientation, which orientation is the preferred one when the layers of the MR element have an fcc structure.

Iwasaki et al et al discloses that NiFeCr has an fcc structure and (111) orientation (see col. 8, lines 32-36). This fcc magnetic film promotes the fcc (111) orientation. Thus, a large resistance change ratio due to the smooth surface and the soft magnetization due to the fcc (111) orientation can be accomplished.

From this teaching, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the above NiFeCr film to have had a fcc structure and (111) orientation, as taught by Iwasaki et al. The motivation would have been: having an fcc structure with an (111) orientation produces a highly orientated crystal structured film which obtains good soft magnetic. A film having such characteristics would contribute to producing a high-sensitivity, stable MR element with high magnetoresistance output, as would have been realized by a skilled artisan, and as discussed in Iwasaki et al.

Still further, as per claim 2, Aoshima et al disclose the film thickness of the second base film (22) is within a range of 20 to 100Å, i.e., 3 nm (equivalent to 30 Å, see column 3, line 38); as per claim 3, Aoshima et al disclose that the content of Cr in the second base film (22) is within the range of 20 to 50 at%, i.e., 24.3 at% (see col. 4, line 31); and as per claim 4, the spin valve MR sensor is located within a thin film magnetic head (see FIG. 4).

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoshima et al (US 6,046,892). Aoshima et al discloses a spin valve magnetoresistance sensor (20), as shown primarily in FIGs. 4 & 5, including: a base layer (21, 22) layered on top of a substrate (not shown, see col. 3, line 3); the base layer including a first base film 21 having a nonmagnetic metal, i.e., Ta and a second base film (22) formed on top of the first base film; the second base

film (22) having an alloy represented by NiFeX wherein X includes one of Cr, Nb and Rh, i.e., NiFeCr, the second base film having a face-centered cubic (fcc) structure and a (111) orientation. The fcc structure is inherent to the NiFeCr layer since it follows from the PdPtMn being of fcc structure, i.e., the head would not operate properly if NiFeCr (and Ta layer 21) did not also have a fcc structure.

Aoshima et al is expressly silent, however, as to the NiFeCr layer having an (111) orientation, which orientation is the preferred one when the layers of the MR element have an fcc structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the above NiFeCr film to have had a fcc structure and (111) orientation. The fcc structure in an (111) orientation is known to have a highly orientated crystal structure while no magnetic anisotropy appears in this orientation. Furthermore, such orientation is the closest packed orientation, i.e., most stable. These favorable characteristics would have been realized by a skilled artisan.

The motivation would have been: having an fcc structure with an (111) orientation produces a highly orientated crystal structured film which obtains good soft magnetic characteristics. A film having such characteristics would contribute to producing a high-sensitivity, stable MR element with high magnetoresistance output, as would have been realized by a skilled artisan.

Still further, as per claim 2, Aoshima et al disclose the film thickness of the second base film (22) is within a range of 20 to 100Å, i.e., 3 nm (equivalent to 30 Å, see column 3, line 38); as per claim 3, Aoshima et al disclose that the content of Cr in the second base film (22) is within the range of 20 to 50 at%, i.e., 24.3 at% (see col. 4, line 31); and as per claim 4, the spin valve MR sensor is located within a thin film magnetic head (see FIG. 4).

(11) Response to Arguments

A... Appellants assert (on page 5, 3rd P of the Appeal Brief) that "Aoshima does not teach, disclose, or suggest a second base film having a fcc structure and a (111) orientation, as recited in claim 1" and "A specific structure in one layer does not necessarily imply or suggest a specific crystalline orientation in the same layer, nor does it suggest a particular structure or orientation in another layer."

The Examiner maintains that the fcc structure in an (111) orientation is known to have a highly orientated crystal structure while no magnetic anisotropy appears in this orientation and with such favorable characteristics, would have been readily apparent to a skilled artisan to have utilized such a configuration. The technical reasoning for providing obviousness is the knowledge that a skilled artisan has, that to achieve a higher pinning field in a spin valve MR sensor, it is needed to have a highly orientated crystal structure, which preferred structure is known commonly as an fcc structure with a (111) orientation.

Even assuming arguendo that Iwasaki's magnetic head has a different structure and/or orientation, Appellants have not provided any comparative testing results to show unexpected and unobvious results between the inventive head structure and Aoshima's magnetic head. In this situation, such results could have been persuasive.

B... Appellants further assert (on page 6, 3rd P of the "Appeal Brief), that "Aoshima and Iwasaki could only have been combined in the manner suggested by the Examiner through carefully considered hindsight using the present invention as a reconstructive guide."

In response to this argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a

sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In the instant application, the Examiner has relied upon Aoshima to show every claim limitation aside from the (111) orientation of the denoted film. The Iwasaki reference is considered to be within the realm of pertinent prior art, as it is also directed to a magnetoresistive head as in Aoshima et al, which teachings would have been reviewed by a skilled artisan in the art. Iwasaki et al et al specifically discloses that NiFeCr has an fcc structure and (111) orientation (see col. 8, lines 32-36). This fcc magnetic film promotes the fcc (111) orientation. Thus, a large resistance change ratio due to the smooth surface and the soft magnetization due to the fcc (111) orientation can be accomplished.

From this teaching, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the above NiFeCr film to have had a fcc structure and (111) orientation, as taught by Iwasaki et al. A film having such characteristics would contribute to producing a high-sensitivity, stable MR element with high magnetoresistance output, as would have been realized by a skilled artisan, and as discussed in Iwasaki et al.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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bem
November 16, 2004

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